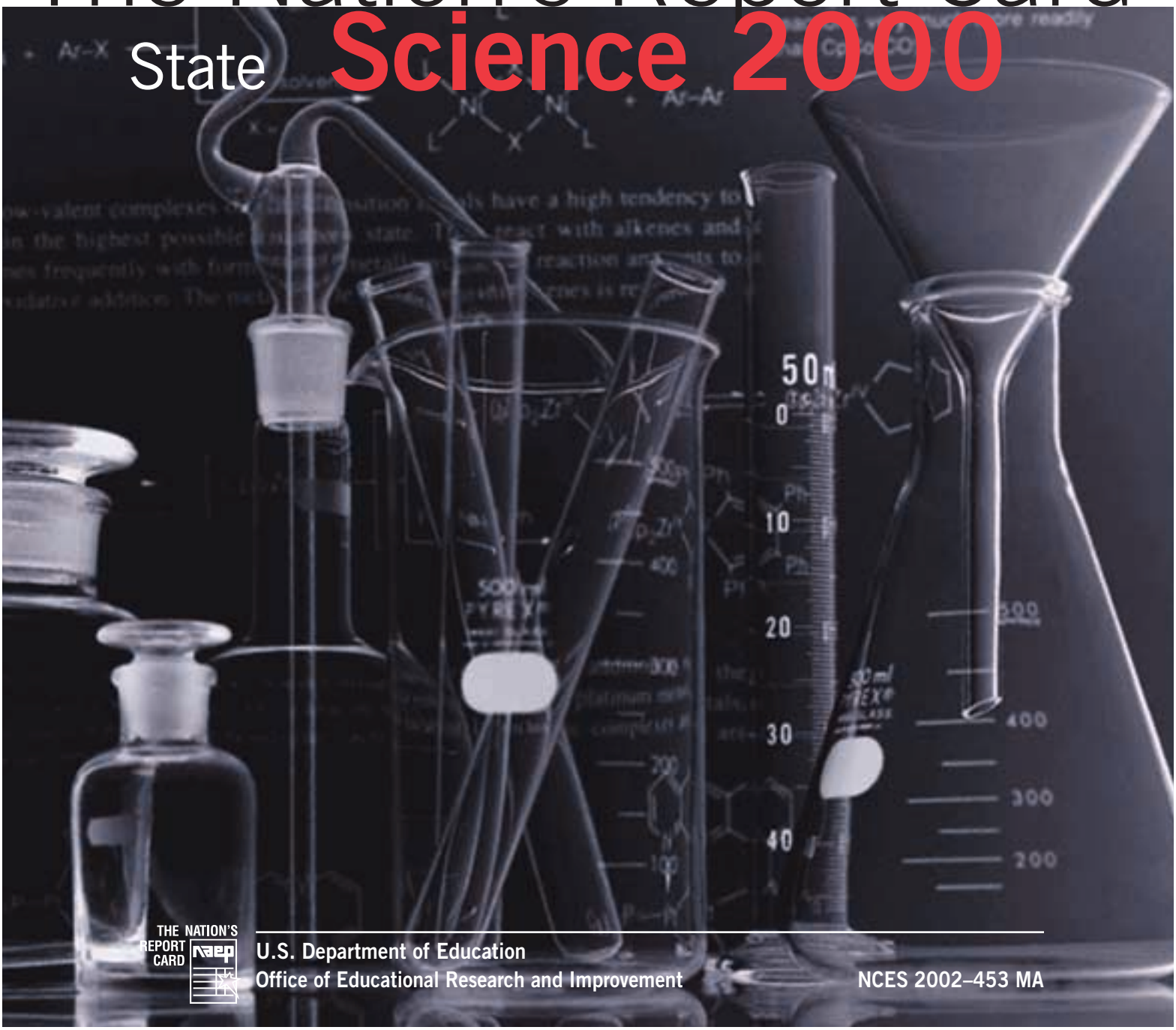
Report for Massachusetts

Findings from the
National Assessment of Educational Progress

National Center for Education Statistics

The Nation's Report Card

State Science 2000



THE NATION'S REPORT CARD

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Massachusetts

KEY FINDINGS

For grade 4:

- The average scale score for students in Massachusetts was 162. This was higher than the average score across the nation (148).
- Students' scale scores in Massachusetts were higher than those in 38 jurisdictions and not significantly different from those in 5 jurisdictions.
- The percentage of students who performed at or above the *Proficient* level was 43 percent. This was greater than the national percentage (28 percent).

For grade 8:

- The average scale score for students in Massachusetts was 161. This was higher than the average score for the nation (149), and did not differ significantly from Massachusetts' average score in 1996 (157).
- Students' scale scores in Massachusetts were higher than those in 30 jurisdictions, not significantly different from those in 10 jurisdictions, and lower than that in 1 jurisdiction.
- The percentage of students who performed at or above the *Proficient* level was 42 percent. This was greater than the percentage of students nationwide performing at this level (30 percent).

This report provides selected results from the National Assessment of Educational Progress (NAEP) for Massachusetts' public school students at grades 4 and 8. The science assessment was administered at the state level at grade 8 in 1996 and at grades 4 and 8 in 2000. Massachusetts participated in both of these assessments and met the criteria for reporting public school results. *The Nation's Report Card: Science Highlights 2000* provides additional results from the assessment and is available on the NAEP web site listed in the box below. NAEP is a project of the National Center for Education Statistics (NCES).

Contents

The full set of results is available in an interactive database on the NAEP web site, http://nces.ed.gov/nationsreportcard. Released test questions and question-level performance data are also available on the web site.

Introduction

The content for each NAEP assessment is developed through a national consensus process directed by the National Assessment Governing Board (NAGB). The consensus process implemented for science required the active participation of teachers, curriculum specialists, subject matter specialists, local school administrators, parents, and members of the general public. The objectives for each NAEP assessment are described in a "framework," a document that delineates the important content and process areas to be measured, as well as the types of questions to be included on the assessment. The science framework is available on the NAGB web site at http://www.nagb.org/pubs/96-2000science/toc.html.

What Was Assessed?

The *Science Framework for the 1996 and 2000 National Assessment of Educational Progress* guided the 2000 science assessment. A description of the assessment and released test questions are available on the NAEP web site, http://nces.ed.gov/nationsreportcard. In addition, more information about NAEP is available at "Frequently Asked Questions" on the web site at http://nces.ed.gov/naep3/faq.asp.

The science framework is organized along two major dimensions, (1) the three fields of science: earth, physical, and life sciences, and (2) the three elements of knowing and doing science: conceptual understanding, scientific investigation, and practical reasoning. Each question is categorized as measuring one of the elements of knowing and doing within one of the fields of science.

The assessment includes multiple-choice items that assess students' knowledge of important facts and concepts and that probe their analytical reasoning skills. The assessment also includes constructed-response items that ask students to explain, apply, design, and communicate scientific information. In addition, about half of the students assessed were asked to perform a hands-on task that probes students' abilities to use materials to perform investigations, evaluate experimental results, and apply problem-solving skills. The same series of test booklets is used in both the national and state assessments.

Who Was Assessed?

For the NAEP state assessments, a target for each jurisdiction is a sample of 100 schools and 2500 students, except in small or sparsely populated jurisdictions. The sample of schools and students is chosen in a two-stage sampling process. First, the sample of schools is selected by probability sampling methods. Then, within the participating schools, random samples of students are chosen. These methods are described in the Technical Information section of the web site at http://nces.ed.gov/nationsreportcard. Sample sizes for all participating jurisdictions are shown in table 7. The state results and the regional and national results are based on *different* and *separate* samples. That is, the regional and national results are not based on aggregated state assessment data and do not include any students from the U.S. territories.

The overall participation rate for schools and students in each state or jurisdiction must meet guidelines established by NCES and NAGB in order for assessment results to be reported publicly. A state or jurisdiction that participates but does not meet minimum participation rate guidelines does not have its data reported to the public. Jurisdictions that meet minimum participation guidelines, but whose sample participation rates were low enough to raise concern about their representativeness, receive notations in state data tables in this report. For more information about participation guidelines, see the Technical Information section of the web site at http://nces.ed.gov/nationsreportcard.

The NAEP state assessment in science was first administered to public school students at grade 8 in 1996 and was expanded to include students at grade 4 as well as grade 8 in 2000.

How Is Student Performance Reported?

The results of student performance on the NAEP assessments are reported for various groups of students (for example, fourth-grade female students or students who took the assessment in different years). No individual student scores are reported by NAEP. The differences in performance between groups of students that are discussed in this report are based on statistical tests that consider both the magnitude of the differences between averages or percentages and the standard error of those statistics. The reader is cautioned to rely on the reported differences, which are statistically significant, in the text and tables rather than on the apparent magnitude of any difference.

Statistically significant differences between 2000 and 1996 are marked with the notation * in the tables. Differences among groups within a year are discussed in the text, but not marked within the tables. Student science performance is described in two ways: 1) average scale scores; and 2) achievement levels.

Scale Scores: Student performance is reported as an average score based on the NAEP science scale, which ranges from 0 to 300 and is linked to its corresponding scale in 1996. The average scale score reflects the overall science performance of a particular group of students. While the numeric scale-score ranges are identical, the scales were derived independently for each grade. Therefore, scale scores across grades cannot be compared. More information on the NAEP science scale scores is available in the Technical Information section of the web site at http://nces.ed.gov/nationsreportcard.

Achievement Levels: Student science performance is also reported in terms of three achievement levels: *Basic, Proficient,* and *Advanced*. Results based on achievement levels are expressed in terms of the percentage of students who attained each level. The three achievement levels are defined as follows:

- *Basic*: This level denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade.
- *Proficient*: This level represents solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter.
- *Advanced*: This level signifies superior performance.

The achievement levels are performance standards adopted by NAGB as part of its statutory responsibilities. The levels represent collective judgments of what students should know and be able to do for each grade tested. They are based on recommendations by broadly representative panels of classroom teachers, education specialists, and members of the general public. As provided by law, the Acting Commissioner of Education Statistics, upon review of congressionally mandated evaluations of NAEP, has determined that the achievement levels are to be considered developmental and should be interpreted and used with caution. However, both the Acting Commissioner and NAGB believe these performance standards are useful for understanding trends in student achievement. They have been widely used by national and state officials, including those comprising the National Education Goals Panel, as a common yardstick of academic performance. The science achievement level descriptions are summarized for grades 4 and 8 in figure 1 on page 4.

The results displayed in the *The Nation's Report Card: Science Highlights 2000* are based on representative national and state samples that include students with disabilities and limited English proficient students. In past assessments, however, no testing accommodations or adaptations were made available to the special-needs students in these samples. To preserve comparability with the sample from 1996, the assessment results for 2000 are based on a sample of students for whom testing accommodations were not permitted. This sample allowed the maintenance of NAEP trend data. In the future, accommodations will be permitted in all NAEP assessments.

In this report, overall scale score and achievement level results are presented first for the sample of students in which testing accommodations were not permitted. This sample permits comparisons with past testing years. The "Key Findings" on page 1 of this report are based on this sample. These results are followed by results for a sample of students in which testing accommodations were permitted. The same is true of the comparisons between states: first are the comparisons based on the sample in which accommodations were not permitted, then results based on the sample in which accommodations were permitted are presented. Science performance disaggregated by demographic characteristics is presented only for the sample in which accommodations were not permitted. Results for the sample in which accommodations were permitted are available on the NAEP web site. For more information, see **Toward a More Inclusive NAEP** beginning on page 27 of this report.

FIGURE 1

The Nation's Report Card Science 2000 State Assessment

1996 and 2000 Science Achievement Level Descriptions

Grade 4

BASIC LEVEL (138)	Students performing at the *Basic* level demonstrate some of the knowledge and reasoning required for understanding of the earth, physical, and life sciences at a level appropriate to Grade 4. For example, they can carry out simple investigations and read uncomplicated graphs and diagrams. Students at this level also show a beginning understanding of classification, simple relationships and energy.
PROFICIENT LEVEL (170)	Students performing at the *Proficient* level demonstrate the knowledge and reasoning required for understanding of the earth, physical, and life sciences at a level appropriate to Grade 4. For example, they understand concepts relating to the Earth's features, physical properties, and structure and function. In addition, students can formulate solutions to familiar problems as well as show a beginning awareness of issues associated with technology.
ADVANCED LEVEL (205)	Students performing at the *Advanced* level demonstrate a solid understanding of the earth, physical, and life sciences as well as the ability to apply their understanding to practical situations at a level appropriate to Grade 4. For example, they can perform and critique simple investigations, make connections from one or more of the sciences to predict or conclude, and apply fundamental concepts to practical applications.

Grade 8

BASIC LEVEL (143)	Students performing at the *Basic* level demonstrate some of the knowledge and reasoning required for understanding of the earth, physical, and life sciences at a level appropriate to Grade 8. For example, they can carry out investigations and obtain information from graphs, diagrams, and tables. In addition, they demonstrate some understanding of concepts relating to the solar system and relative motion. Students at this level also have a beginning understanding of cause-and-effect relationships.
PROFICIENT LEVEL (170)	Students performing at the *Proficient* level demonstrate much of the knowledge and many of the reasoning abilities essential for understanding of the earth, physical, and life sciences at a level appropriate to Grade 8. For example, students can interpret graphic information, design simple investigations, and explain such scientific concepts as energy transfer. Students at this level also show an awareness of environmental issues, especially those addressing energy and pollution.
ADVANCED LEVEL (208)	Students performing at the *Advanced* level demonstrate a solid understanding of the earth, physical, and life sciences as well as the abilities required to apply their understanding in practical situations at a level appropriate to Grade 8. For example, students perform and critique the design of investigations, relate scientific concepts to each other, explain their reasoning, and discuss the impact of human activities on the environment.

NOTE: Source: Bourque, M.L., Champagne, A.B. & Crissman, S. (1997) *National Assessment of Educational Progress 1996 Science Performance Standards: Achievement Results for the Nation and the States*, Washington, DC: National Assessment Governing Board, U.S. Department of Education.

NAEP 2000 Science Overall Scale Score and Achievement Level Results for Public School Students

Overall Scale Score Results

Tables 1A and 1B show the overall performance of public school students in Massachusetts, the Northeast region, and the nation. Table 1A displays overall performance for 1996 and 2000 for the sample of students in which accommodations were not permitted, whereas table 1B shows overall performance for 2000 for the sample in which accommodations were permitted. To determine whether Massachusetts has a significant difference between the two samples, see table 7.

In each table, the first column of results presents the average score on the NAEP science scale. The subsequent columns show the average score at selected percentiles. For example, at the 10th percentile for grade 4 students in the nation, 10 percent of public school students had a score that was lower than 103 while 90 percent had a score that was higher.

Grade 4 Scale Score Results: Sample in Which Accommodations Were Not Permitted

- In 2000, the average scale score for students in Massachusetts was 162. This was higher than that of students across the nation (148).

Grade 8 Scale Score Results: Sample in Which Accommodations Were Not Permitted

- In 2000, the average scale score for students in Massachusetts was 161. This was higher than that of students across the nation (149).
- In Massachusetts, the average scale score for students in 2000 did not differ significantly from that in 1996 (157). Similarly, the average scale score for students across the nation in 2000 was not significantly different from that in 1996 (148).

TABLE 1A

The Nation's Report Card Science 2000 State Assessment

Average science scale scores and selected percentiles for public school students at grades 4 and 8 for the sample in which accommodations were not permitted: 1996 and 2000

		Average scale score	Scale score distribution				
			10th percentile	25th percentile	50th percentile	75th percentile	90th percentile
Grade 4							
2000	Massachusetts	162 (1.2)	122 (3.0)	144 (2.1)	165 (1.2)	182 (1.0)	197 (1.7)
	Northeast	152 (1.2)	108 (2.4)	131 (1.8)	154 (2.1)	175 (1.9)	192 (1.5)
	Nation	148 (0.8)	103 (1.4)	127 (1.0)	151 (1.0)	173 (1.0)	190 (0.9)
Grade 8							
2000	Massachusetts	161 (1.6)	118 (3.5)	141 (2.3)	164 (1.3)	184 (1.1)	200 (1.4)
	Northeast	152 (1.8)	103 (2.7)	127 (2.3)	153 (2.7)	177 (2.5)	196 (2.5)
	Nation	149 (0.7)	101 (2.2)	125 (0.8)	152 (1.0)	175 (0.7)	194 (1.3)
1996	Massachusetts	157 (1.4)	114 (2.5)	137 (2.6)	160 (1.9)	179 (1.1)*	196 (1.6)
	Northeast	149 (2.9)	103 (5.4)	127 (4.5)	151 (2.7)	173 (3.9)	191 (3.0)
	Nation	148 (0.9)	102 (1.7)	126 (1.2)	151 (0.8)	172 (1.1)*	191 (1.4)

NOTE: The NAEP science scale ranges from 0 to 300. The standard errors of the statistics in the table appear in parentheses.
If the notation * appears, it signifies that this value is significantly different from the value for 2000.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Grade 4 Scale Score Results: Sample in Which Accommodations Were Permitted

- In 2000, the average scale score for students in Massachusetts was 161. This was higher than that of students across the nation (147).

Grade 8 Scale Score Results: Sample in Which Accommodations Were Permitted

- In 2000, the average scale score for students in Massachusetts was 158. This was higher than that of students across the nation (149).

TABLE 1B

The Nation's Report Card Science 2000 State Assessment

Average science scale scores and selected percentiles for public school students at grades 4 and 8 for the sample in which accommodations were permitted: 2000

		Average scale score	Scale score distribution				
			10th percentile	25th percentile	50th percentile	75th percentile	90th percentile
Grade 4							
2000	Massachusetts	161 (1.4)	123 (2.9)	144 (2.2)	164 (1.7)	181 (1.1)	196 (1.5)
	Northeast	151 (1.5)	105 (3.2)	129 (2.2)	154 (2.2)	175 (1.9)	192 (1.4)
	Nation	147 (0.7)	99 (1.5)	124 (1.0)	149 (0.7)	172 (0.8)	189 (1.2)
Grade 8							
2000	Massachusetts	158 (1.1)	113 (1.8)	137 (1.6)	161 (1.4)	182 (1.2)	199 (1.3)
	Northeast	152 (2.4)	104 (2.5)	128 (2.1)	154 (2.8)	178 (2.2)	196 (5.3)
	Nation	149 (0.8)	101 (1.0)	125 (1.5)	151 (1.0)	175 (1.0)	194 (1.2)

NOTE: The NAEP science scale ranges from 0 to 300. The standard errors of the statistics in the table appear in parentheses.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Overall Achievement Levels Results

Tables 1C and 1D present the percentages of students who performed below *Basic*, at or above *Basic*, at or above *Proficient*, and at the *Advanced* level. Table 1C is based on the sample in which accommodations were not permitted whereas table 1D presents results for the sample in which accommodations were permitted. In each table, because the percentages are cumulative from *Basic* to *Proficient* to *Advanced*, they may sum to more than 100 percent. Only the percentage of students at or above *Basic* (which includes the students at *Proficient* and *Advanced*) plus the students below *Basic* will always sum to 100 percent.

Grade 4 Achievement Level Results: Sample in Which Accommodations Were Not Permitted

- In 2000, the percentage of Massachusetts' students who performed at or above the *Proficient* level was 43 percent. This was greater than the percentage of the nation's public school students who performed at the same level (28 percent).

Grade 8 Achievement Level Results: Sample in Which Accommodations Were Not Permitted

- In 2000, the percentage of Massachusetts' students who performed at or above the *Proficient* level was 42 percent. This was greater than the percentage of the nation's public school students who performed at or above *Proficient* (30 percent).
- In Massachusetts, the percentage of students who performed at or above the *Proficient* level in 2000 was greater than that in 1996 (37 percent).

TABLE 1C

The Nation's Report Card Science 2000 State Assessment

Percentages of public school students attaining achievement levels at grades 4 and 8 for the sample in which accommodations were not permitted: 1996 and 2000

		Below *Basic*	At or Above *Basic*	At or Above *Proficient*	*Advanced*
Grade 4					
2000	Massachusetts	19 (1.4)	81 (1.4)	43 (1.9)	6 (0.7)
	Northeast	32 (1.7)	68 (1.7)	31 (1.9)	4 (0.9)
	Nation	36 (0.9)	64 (0.9)	28 (0.9)	3 (0.3)
Grade 8					
2000	Massachusetts	26 (2.0)	74 (2.0)	42 (1.9)	5 (0.6)
	Northeast	39 (2.2)	61 (2.2)	33 (2.3)	5 (1.1)
	Nation	41 (0.9)	59 (0.9)	30 (0.9)	4 (0.4)
1996	Massachusetts	31 (1.8)	69 (1.8)	37 (1.7)*	4 (0.6)
	Northeast	40 (3.6)	60 (3.6)	28 (3.5)	2 (1.2)
	Nation	40 (1.1)	60 (1.1)	27 (1.3)	3 (0.5)

NOTE: The NAEP science scale ranges from 0 to 300. The achievement levels correspond to the following points on the NAEP science scale at grade 4 (and 8): *Basic*, 138–169 (143–169); *Proficient*, 170–204 (170–207); and *Advanced*, 205 (208) and above. The standard errors of the statistics in the table appear in parentheses.
If the notation * appears, it signifies that this value is significantly different from the value for 2000.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Grade 4 Achievement Level Results: Sample in Which Accommodations Were Permitted

- In 2000, the percentage of Massachusetts' students who performed at or above the *Proficient* level was 42 percent. This was greater than the percentage of the nation's public school students who performed at the same level (27 percent).

Grade 8 Achievement Level Results: Sample in Which Accommodations Were Permitted

- In 2000, the percentage of Massachusetts' students who performed at or above the *Proficient* level was 39 percent. This was greater than the percentage of the nation's public school students who performed at the same level (30 percent).

TABLE 1D

The Nation's Report Card Science 2000 State Assessment

Percentages of public school students attaining achievement levels at grades 4 and 8 for the sample in which accommodations were permitted: 2000

		Below *Basic*	At or Above *Basic*	At or Above *Proficient*	*Advanced*
Grade 4					
2000	Massachusetts	19 (1.5)	81 (1.5)	42 (1.7)	5 (0.9)
	Northeast	34 (2.0)	66 (2.0)	31 (1.6)	4 (0.6)
	Nation	38 (0.9)	62 (0.9)	27 (0.9)	3 (0.4)
Grade 8					
2000	Massachusetts	30 (1.5)	70 (1.5)	39 (1.9)	5 (0.6)
	Northeast	39 (2.7)	61 (2.7)	33 (3.1)	5 (1.2)
	Nation	41 (1.0)	59 (1.0)	30 (0.9)	4 (0.4)

NOTE: The NAEP science scale ranges from 0 to 300. The achievement levels correspond to the following points on the NAEP science scale at grade 4 (and 8): *Basic*, 138–169 (143–169); *Proficient*, 170–204 (170–207); and *Advanced*, 205 (208) and above. The standard errors of the statistics in the table appear in parentheses.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Comparisons Between Massachusetts and Other Participating States and Jurisdictions

In 2000, 45 states and other jurisdictions participated in the science assessment. The maps in figures 2A–2D show the participating states and jurisdictions and indicate their membership in four U.S. geographic regions. Note that the U.S. territories and the domestic and overseas Department of Defense Education Activity schools (DoDEA/DDESS and DoDEA/DoDDS) were not placed into any of these regions.

Comparisons by Average Scale Scores

Figures 2A–2D compare Massachusetts' overall 2000 grade 4 and grade 8 science scale scores with those of all other states and participating jurisdictions. Figures 2A and 2B are based on the sample in which accommodations were not permitted. Figures 2C and 2D are based on the sample in which accommodations were permitted. The different shadings are determined by whether or not Massachusetts' average scale score is significantly different from that of each of the other participants in the 2000 NAEP science assessment. Note that states that did not participate in 2000, or that did not meet reporting guidelines, are also represented in the maps.

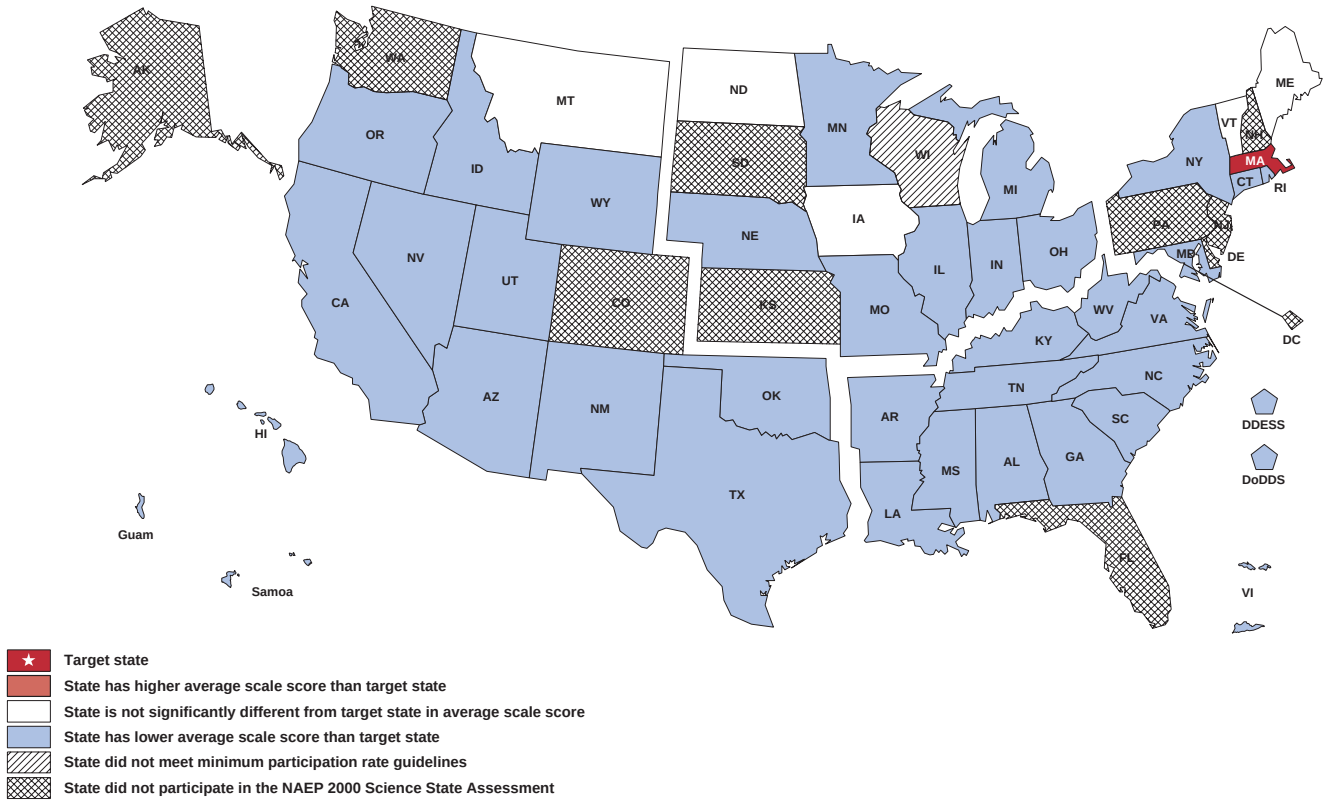
Comparisons by Achievement Levels

Figures 3A–3D permit comparisons of all participants in the NAEP 2000 science assessment in terms of percentages of students performing at or above the *Proficient* level (including *Advanced*). The participating states and jurisdictions are grouped into categories reflecting student performance compared to that in Massachusetts. The jurisdictions are grouped by whether the percentage of their students with scores at or above the *Proficient* level was higher than, not significantly different from, or lower than the percentage in Massachusetts. Each population of students is aligned at the point where the *Proficient* category begins, so that they can be easily compared at *Proficient* and above. Note that the arrangement of the states and the other jurisdictions within each category is alphabetical; statistical comparisons among jurisdictions in each of the three categories are not included in this report. Figures 3A and 3B are based on the sample in which accommodations were not permitted. Figures 3C and 3D are based on the sample in which accommodations were permitted.

FIGURE 2A

The Nation's Report Card Science 2000 State Assessment

Massachusetts' 2000 average science scale score compared to those for other participating jurisdictions for public school students at grade 4 in the sample in which accommodations were not permitted

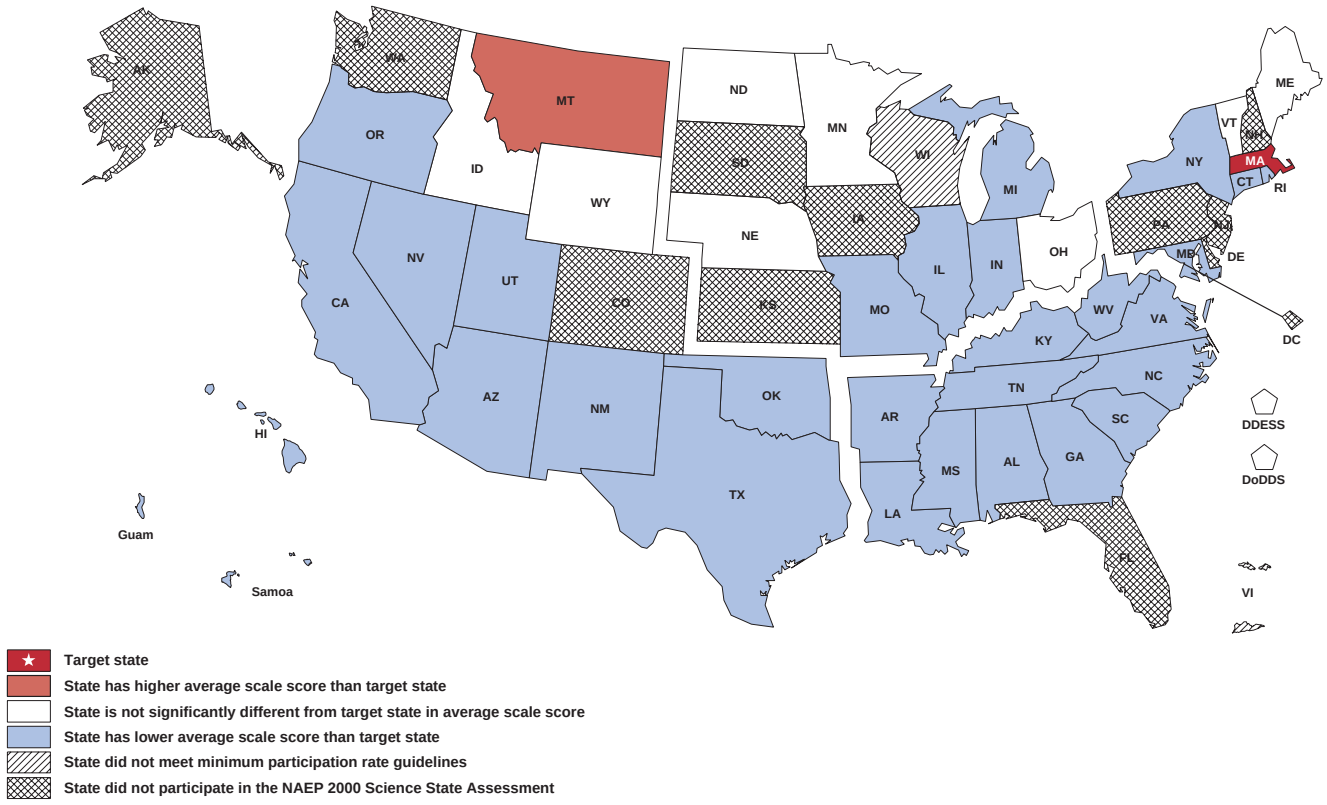


SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

FIGURE 2B

The Nation's Report Card Science 2000 State Assessment

Massachusetts' 2000 average science scale score compared to those for other participating jurisdictions for public school students at grade 8 in the sample in which accommodations were not permitted

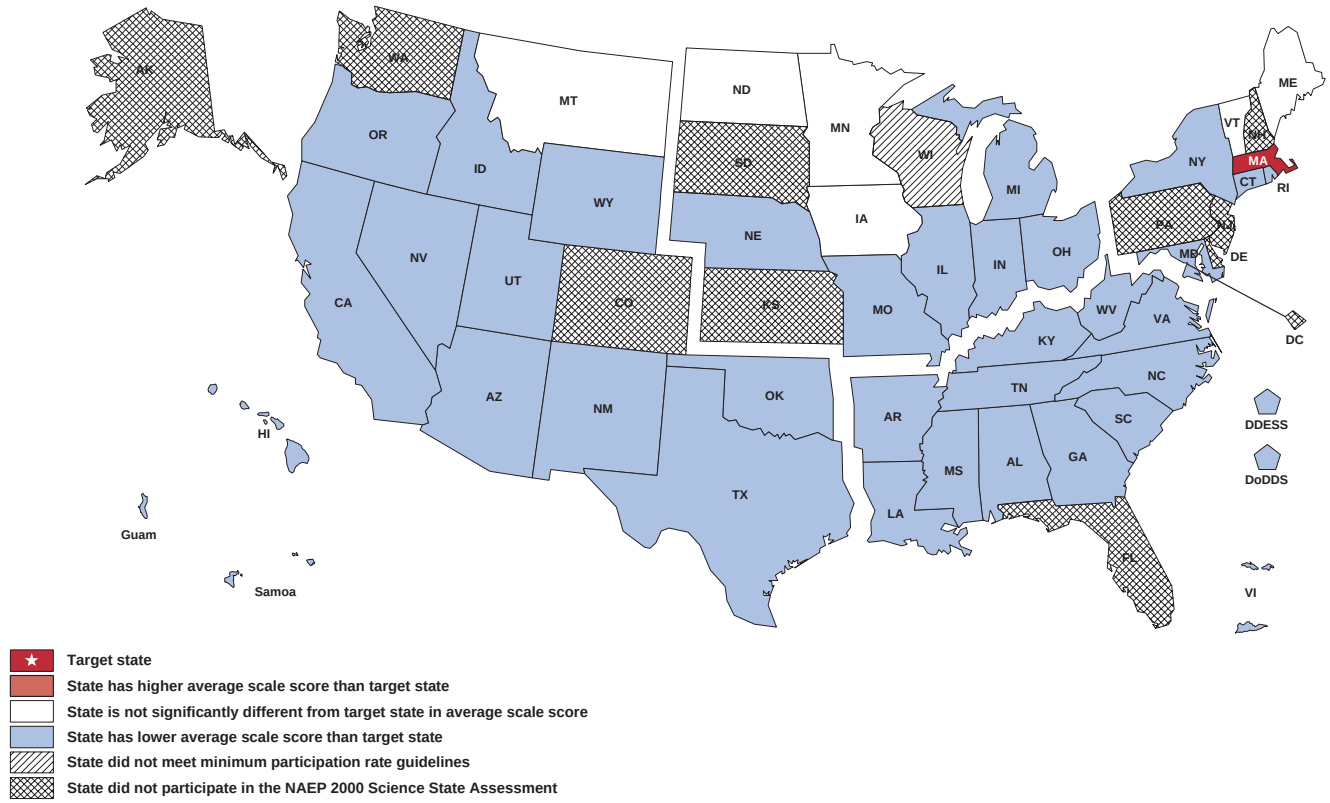


SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

FIGURE 2C

The Nation's Report Card Science 2000 State Assessment

Massachusetts' 2000 average science scale score compared to those for other participating jurisdictions for public school students at grade 4 in the sample in which accommodations were permitted

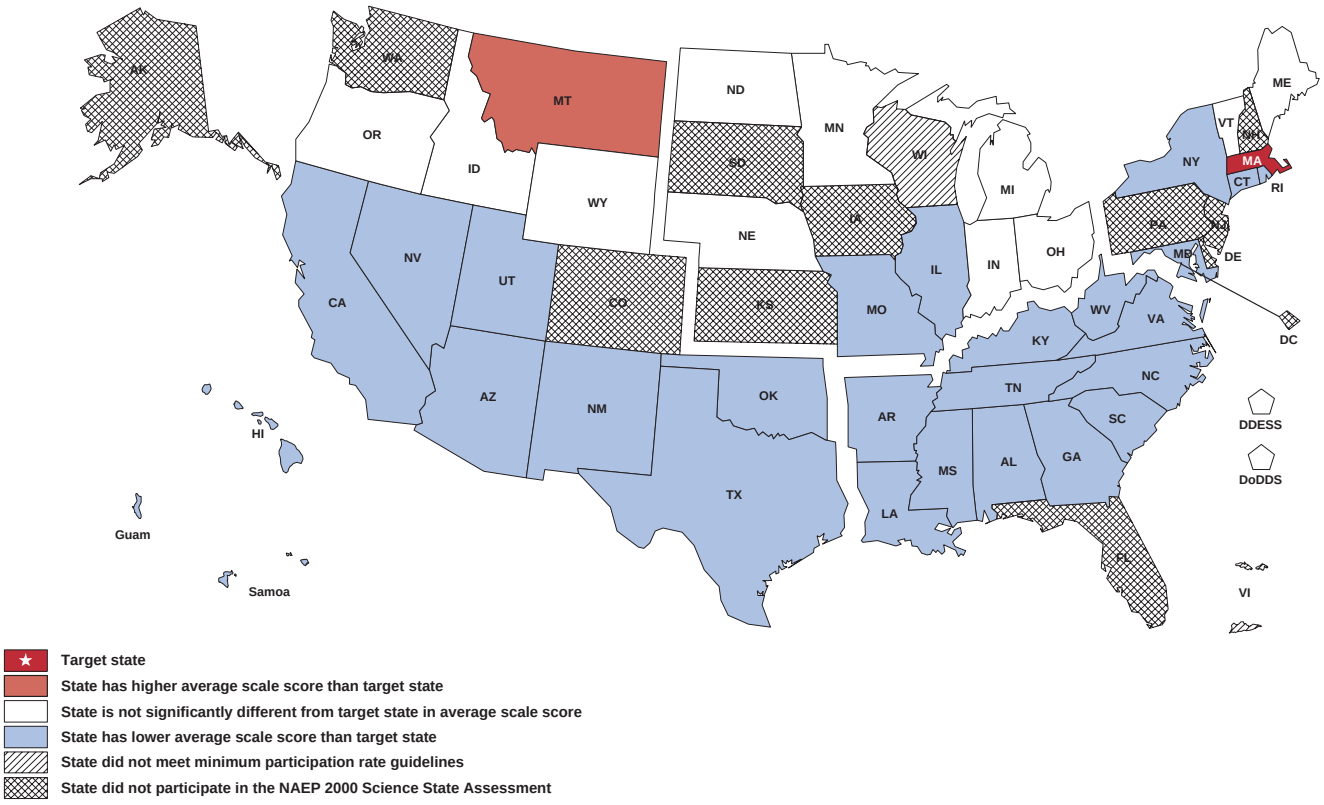


SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

FIGURE 2D

The Nation's Report Card Science 2000 State Assessment

Massachusetts' 2000 average science scale score compared to those for other participating jurisdictions for public school students at grade 8 in the sample in which accommodations were permitted

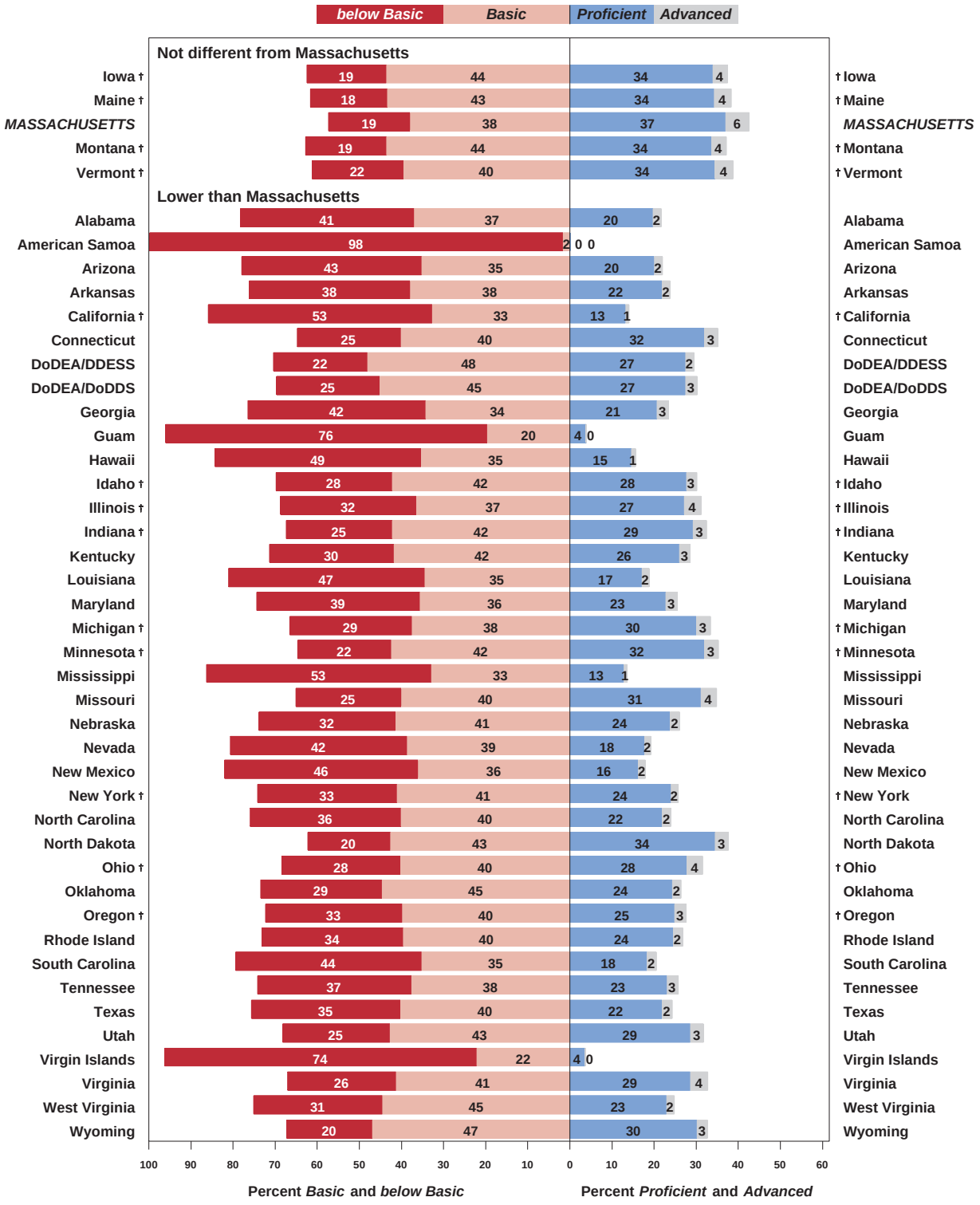


SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

FIGURE 3A

The Nation's Report Card Science 2000 State Assessment

The percentage of public school students at or above the Proficient level in Massachusetts compared with those in other participating jurisdictions at grade 4 in 2000, based on the sample in which accommodations were not permitted



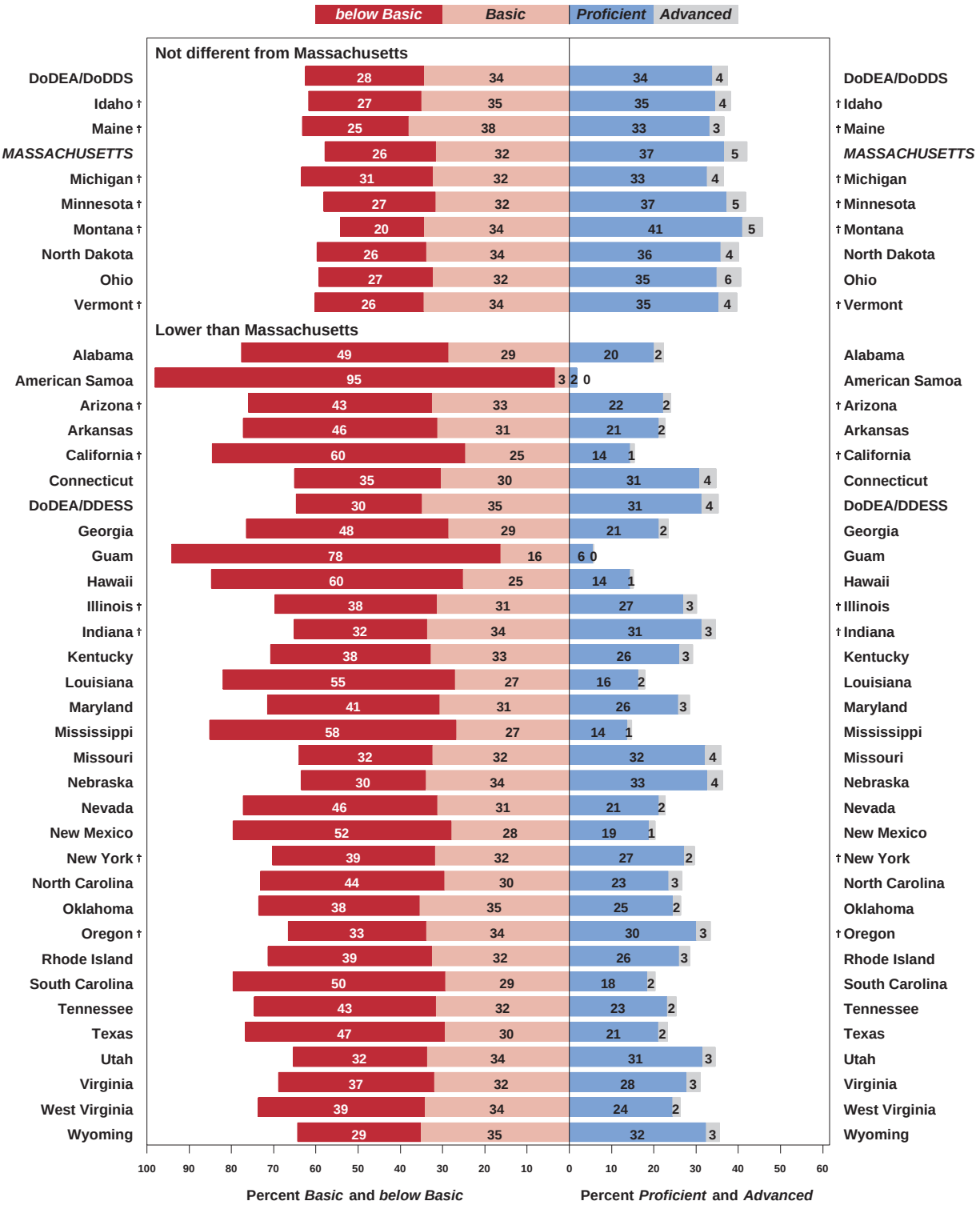
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.

NOTE: The bars above contain estimated percentages of students in each NAEP science achievement category.
Each population of students is aligned at the point where the Proficient category begins, so that they may be compared at Proficient and above.
Numbers may not add to 100, or to the exact percentage at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

FIGURE 3B

The Nation's Report Card Science 2000 State Assessment

The percentage of public school students at or above the Proficient level in Massachusetts compared with those in other participating jurisdictions at grade 8 in 2000, based on the sample in which accommodations were not permitted



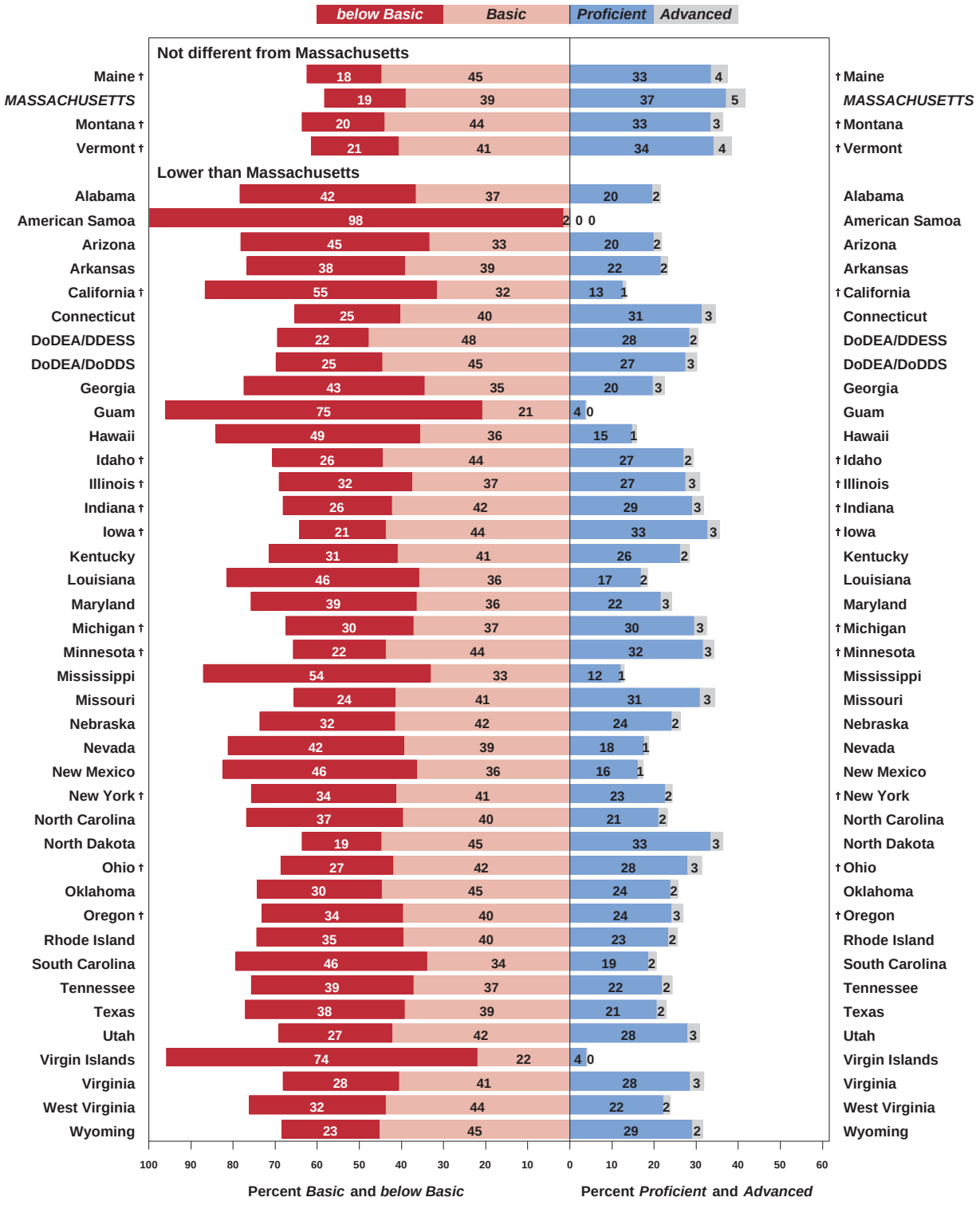
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.

NOTE: The bars above contain estimated percentages of students in each NAEP science achievement category.
Each population of students is aligned at the point where the Proficient category begins, so that they may be compared at Proficient and above.
Numbers may not add to 100, or to the exact percentage at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

FIGURE 3C

The Nation's Report Card Science 2000 State Assessment

The percentage of public school students at or above the Proficient level in Massachusetts compared with those in other participating jurisdictions at grade 4 in 2000, based on the sample in which accommodations were permitted



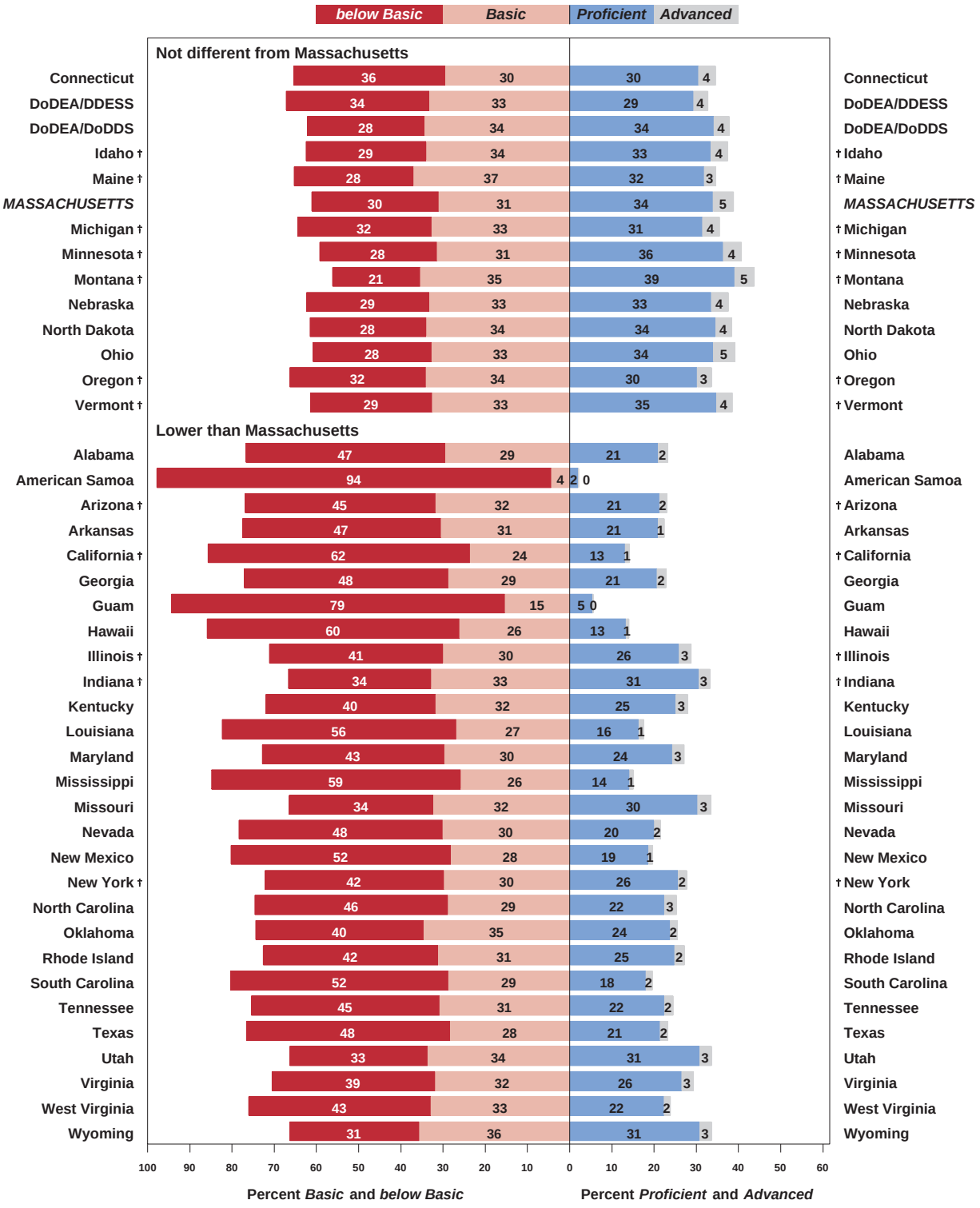
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.

NOTE: The bars above contain estimated percentages of students in each NAEP science achievement category.
Each population of students is aligned at the point where the Proficient category begins, so that they may be compared at Proficient and above.
Numbers may not add to 100, or to the exact percentage at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

FIGURE 3D

The Nation's Report Card Science 2000 State Assessment

The percentage of public school students at or above the Proficient level in Massachusetts compared with those in other participating jurisdictions at grade 8 in 2000, based on the sample in which accommodations were permitted



† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation.

NOTE: The bars above contain estimated percentages of students in each NAEP science achievement category.
Each population of students is aligned at the point where the Proficient category begins, so that they may be compared at Proficient and above.
Numbers may not add to 100, or to the exact percentage at or above achievement levels, due to rounding.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Science Performance by Demographic Characteristics

This section of the report presents results by major demographic variables for fourth- and eighth-grade students in Massachusetts and the nation for the sample in which accommodations were not permitted. In these tables, scale score results and achievement level performance are presented in the same table.

Student performance data for the following demographic variables are reported:

- Gender
- Race/ethnicity
- Eligibility for the free/reduced-price school lunch program
- Type of community in which school is located (2000 only)

Each of the variables is reported in tables that present the percentage of students who belong to each subgroup in the first column and the average scale score in the second column. The columns to the right show the percentage of students at or above each achievement level.

The reader is cautioned against making causal inferences about the performance of these groups relative to these variables. Many factors other than those discussed here may affect student performance.

NAEP collects information on many additional variables including school and home factors related to achievement. All of this information is available in an interactive database on the NAEP web site and can be used to create additional reports of interest to a particular state.

Gender

Tables 2A and 2B show scale score and achievement level data for public school students at grades 4 and 8 in Massachusetts and across the nation by gender in the sample in which accommodations were not permitted. The indicators of significant differences that appear in the tables come from a comparison of performance by males or females over time. Differences in performance between males and females are indicated in the comparisons highlighted below, but are not indicated by notations of significance in the tables.

Grade 4 Scale Score Results by Gender: Sample in Which Accommodations Were Not Permitted

- In Massachusetts, male students' average scale score was 164 in 2000. This was higher than that of female students (159).
- In 2000, male students in Massachusetts had an average scale score in science (164) that was higher than that of male students across the nation (151). Female students in Massachusetts had an average score (159) that was higher than that of female students nationwide (146).

Grade 4 Achievement Level Results by Gender: Sample in Which Accommodations Were Not Permitted

- In 2000, 46 percent of males and 38 percent of females performed at or above the *Proficient* level in Massachusetts. The difference between these percentages was statistically significant.
- The percentage of males in Massachusetts' public schools who were at or above the *Proficient* level in 2000 (46 percent) was greater than that of males in the nation (31 percent).
- The percentage of females in Massachusetts at or above the *Proficient* level in 2000 (38 percent) was greater than that of the nation's females (24 percent).

TABLE 2A

The Nation's Report Card Science 2000 State Assessment

Average science scale scores and achievement level results for public school students by gender at grade 4 for the sample in which accommodations were not permitted: 2000

	Percentage of Students	Average Scale Score	Below *Basic*	At or Above *Basic*	At or Above *Proficient*	*Advanced*
Male						
2000 Massachusetts	52 (1.1)	164 (1.5)	18 (1.7)	82 (1.7)	46 (2.5)	7 (0.9)
Nation	50 (0.5)	151 (1.0)	33 (1.1)	67 (1.1)	31 (1.2)	5 (0.5)
Female						
2000 Massachusetts	48 (1.1)	159 (1.5)	21 (1.9)	79 (1.9)	38 (1.8)	4 (0.8)
Nation	50 (0.5)	146 (0.9)	38 (1.2)	62 (1.2)	24 (1.0)	2 (0.4)

NOTE: The NAEP science scale ranges from 0 to 300. The achievement levels correspond to the following points on the NAEP science scale at grade 4: *Basic*, 138–169; *Proficient*, 170–204; and *Advanced*, 205 and above. The standard errors of the statistics in the table appear in parentheses.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Grade 8 Scale Score Results by Gender: Sample in Which Accommodations Were Not Permitted

- In Massachusetts, male students' average scale score was 162 in 2000. This did not differ significantly from that of female students (160).
- In 2000, male students in Massachusetts had an average scale score in science (162) that was higher than that of male students across the nation (153). Female students in Massachusetts had an average score (160) that was higher than that of female students nationwide (146).
- In Massachusetts, the average scale score of males was not significantly different in 1996 from that in 2000; however, that of females was higher in 2000 than in 1996.

Grade 8 Achievement Level Results by Gender: Sample in Which Accommodations Were Not Permitted

- In 2000, 44 percent of males and 40 percent of females performed at or above the *Proficient* level in Massachusetts. The difference between these percentages was not statistically significant.
- The percentage of males in Massachusetts' public schools who were at or above the *Proficient* level in 2000 (44 percent) was greater than that of males in the nation (35 percent).
- The percentage of females in Massachusetts at or above the *Proficient* level in 2000 (40 percent) was greater than that of the nation's females (26 percent).
- In Massachusetts, the percentages of both males and females performing at or above the *Proficient* level were not significantly different in 2000 from those in 1996.

TABLE 2B

The Nation's Report Card Science 2000 State Assessment

Average science scale scores and achievement level results for public school students by gender at grade 8 for the sample in which accommodations were not permitted: 1996 and 2000

	Percentage of Students	Average Scale Score	Below *Basic*	At or Above *Basic*	At or Above *Proficient*	*Advanced*
Male						
2000 Massachusetts	49 (1.0)	162 (1.8)	26 (2.1)	74 (2.1)	44 (2.3)	6 (1.1)
Nation	51 (0.5)	153 (0.8)	38 (0.9)	62 (0.9)	35 (0.9)	5 (0.7)
1996 Massachusetts	52 (1.0)	159 (1.7)	29 (2.1)	71 (2.1)	40 (2.1)	5 (1.2)
Nation	51 (1.2)	149 (1.1)*	40 (1.5)	60 (1.5)	29 (1.3)*	3 (0.6)
Female						
2000 Massachusetts	51 (1.0)	160 (1.7)	27 (2.5)	73 (2.5)	40 (2.4)	4 (0.8)
Nation	49 (0.5)	146 (0.9)	45 (1.2)	55 (1.2)	26 (1.2)	3 (0.4)
1996 Massachusetts	48 (1.0)	154 (1.5)*	33 (2.1)	67 (2.1)	33 (2.0)	3 (0.8)
Nation	49 (1.2)	148 (1.2)	41 (1.5)	59 (1.5)	26 (1.8)	2 (0.6)

NOTE: The NAEP science scale ranges from 0 to 300. The achievement levels correspond to the following points on the NAEP science scale at grade 8: *Basic*, 143–169; *Proficient*, 170–207; and *Advanced*, 208 and above. The standard errors of the statistics in the table appear in parentheses. If the notation * appears, it signifies that this value is significantly different from the value for 2000.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Race/Ethnicity

As part of the background questionnaire administered to students with the assessment, students were asked to identify the racial/ethnic subgroup that best described them. The five mutually exclusive categories were White, Black, Hispanic, Asian/Pacific Islander, and American Indian or Alaskan Native. This information was the primary contributor to the classifications appearing below. For details of the derivation of this variable, see the Technical Information section of the web site at http://nces.ed.gov/nationsreportcard. Tables 3A and 3B show scale scores and achievement data by racial and ethnic group membership for public school students at grades 4 and 8 in the sample in which accommodations were not permitted. Only the race/ethnicity categories with sufficient membership to meet reporting requirements in Massachusetts are reported below.

*Grade 4 Scale Score Results by Race/Ethnicity: Sample in Which Accommodations Were Not Permitted**

- In 2000, White students in Massachusetts had an average scale score that was higher than those of Black and Hispanic students, but was not significantly different from that of Asian/Pacific Islander students.

Grade 4 Achievement Level Results by Race/Ethnicity: Sample in Which Accommodations Were Not Permitted

- In Massachusetts in 2000, the percentage of White students performing at or above the *Proficient* level was greater than those of Black and Hispanic students, but was not significantly different from that of Asian/Pacific Islander students.

TABLE 3A

The Nation's Report Card Science 2000 State Assessment

Average science scale scores and achievement level results for public school students by race/ethnicity at grade 4 for the sample in which accommodations were not permitted: 2000

	Percentage of Students	Average Scale Score	Below *Basic*	At or Above *Basic*	At or Above *Proficient*	*Advanced*
White						
2000 Massachusetts	76 (1.7)	169 (0.9)	10 (0.9)	90 (0.9)	50 (1.9)	7 (0.8)
Nation	64 (0.4)	159 (0.9)	22 (1.0)	78 (1.0)	37 (1.2)	5 (0.5)
Black						
2000 Massachusetts	6 (1.0)	137 (3.4)	53 (6.4)	47 (6.4)	13 (3.6)	1 (****)
Nation	15 (0.2)	124 (1.7)	67 (2.1)	33 (2.1)	6 (0.9)	0 (****)
Hispanic						
2000 Massachusetts	13 (1.0)	130 (3.1)	60 (4.1)	40 (4.1)	11 (2.4)	1 (****)
Nation	16 (0.3)	127 (1.4)	60 (1.6)	40 (1.6)	10 (0.9)	1 (0.4)
Asian/Pacific Islander						
2000 Massachusetts	4 (0.6)	161 (4.5)	20 (6.4)	80 (6.4)	41 (6.7)	5 (3.0)

NOTE: The NAEP science scale ranges from 0 to 300. The achievement levels correspond to the following points on the NAEP science scale at grade 4: *Basic*, 138–169; *Proficient*, 170–204; and *Advanced*, 205 and above. The standard errors of the statistics in the table appear in parentheses. The 2000 national results for fourth-grade Asian/Pacific Islander students are not included in this report. Following a thorough investigation into the quality and credibility of these results, NCES decided to omit these results from this report. See the Technical Information section of the NAEP web site for details.

**** Standard error estimates cannot be accurately determined.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

* The 2000 national results for fourth-grade Asian/Pacific Islander students are not included in this report. Following a thorough investigation into the quality and credibility of these results, NCES decided to omit these results from this report. See the Technical Information section of the NAEP web site for details.

Grade 8 Scale Score Results by Race/Ethnicity: Sample in Which Accommodations Were Not Permitted

- In 2000, White students in Massachusetts had an average scale score that was higher than those of Black and Hispanic students, but was not significantly different from that of Asian/Pacific Islander students.
- The average scale score of White students in Massachusetts was higher in 2000 than in 1996. The average scale scores of Black, Hispanic, and Asian/Pacific Islander students in Massachusetts did not differ significantly in 2000 from those in 1996.

Grade 8 Achievement Level Results by Race/Ethnicity: Sample in Which Accommodations Were Not Permitted

- In Massachusetts in 2000, the percentage of White students performing at or above the *Proficient* level was greater than those of Black and Hispanic students, but was not significantly different from that of Asian/Pacific Islander students.
- The percentage of White students in Massachusetts performing at or above the *Proficient* level was greater in 2000 than in 1996. The respective percentages of Black, Hispanic, and Asian/Pacific Islander students in Massachusetts performing at or above the *Proficient* level did not differ significantly in 2000 from those in 1996.

TABLE 3B

The Nation's Report Card Science 2000 State Assessment

Average science scale scores and achievement level results for public school students by race/ethnicity at grade 8 for the sample in which accommodations were not permitted: 1996 and 2000

	Percentage of Students	Average Scale Score	Below *Basic*	At or Above *Basic*	At or Above *Proficient*	*Advanced*
White						
2000 Massachusetts	76 (1.7)	168 (1.1)	17 (1.9)	83 (1.9)	49 (2.0)	6 (0.8)
Nation	66 (0.3)	160 (0.8)	28 (1.0)	72 (1.0)	40 (1.1)	5 (0.7)
1996 Massachusetts	81 (1.7)	163 (1.2)*	23 (1.5)	77 (1.5)	41 (1.8)*	4 (0.6)
Nation	68 (0.4)*	159 (1.1)	28 (1.4)	72 (1.4)	36 (1.8)	4 (0.8)
Black						
2000 Massachusetts	8 (0.9)	134 (4.0)	62 (5.2)	38 (5.2)	12 (3.5)	2 (1.2)
Nation	14 (0.2)	121 (1.3)	76 (1.6)	24 (1.6)	6 (0.8)	0 (0.2)
1996 Massachusetts	6 (1.0)	126 (3.3)	72 (4.9)	28 (4.9)	9 (2.7)	0 (****)
Nation	15 (0.3)*	120 (1.2)	77 (1.7)	23 (1.7)	4 (0.8)	0 (****)
Hispanic						
2000 Massachusetts	10 (1.2)	128 (4.0)	65 (4.5)	35 (4.5)	12 (2.5)	1 (****)
Nation	14 (0.2)	127 (1.4)	67 (1.7)	33 (1.7)	11 (1.2)	1 (0.2)
1996 Massachusetts	8 (0.7)	126 (3.9)	65 (5.6)	35 (5.6)	11 (2.8)	0 (****)
Nation	12 (0.3)*	127 (1.8)	65 (2.3)	35 (2.3)	10 (1.2)	0 (****)
Asian/Pacific Islander						
2000 Massachusetts	5 (0.6)	165 (3.9)	28 (5.2)	72 (5.2)	46 (6.2)	11 (2.8)
Nation	4 (0.2)	154 (2.7)	38 (3.9)	62 (3.9)	36 (3.9)	6 (1.5)
1996 Massachusetts	4 (0.8)	152 (7.3)!	36 (8.0)!	64 (8.0)!	38 (7.9)!	5 (3.9)!
Nation	2 (0.3)*	150 (3.3)	41 (4.5)	59 (4.5)	27 (3.6)	2 (1.5)

NOTE: The NAEP science scale ranges from 0 to 300. The achievement levels correspond to the following points on the NAEP science scale at grade 8: *Basic*, 143–169; *Proficient*, 170–207; and *Advanced*, 208 and above. The standard errors of the statistics in the table appear in parentheses.
If the notation * appears, it signifies that this value is significantly different from the value for 2000.
! Interpret with caution—the nature of the sample does not allow accurate determination of the variability of this statistic.
**** Standard error estimates cannot be accurately determined.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Free/Reduced-Price Lunch Program Eligibility

NAEP collects data on eligibility for the federal program providing free or reduced-price school lunches. Eligibility is determined through the USDA's Income Eligibility Guidelines and is included in this report as an indicator of poverty. The free/reduced-price lunch component of the National School Lunch Program (NSLP), offered through the U.S. Department of Agriculture (USDA), is designed to ensure that children near or below the poverty line receive nourishing meals. This program is available to public schools, nonprofit private schools, and residential child care institutions. Tables 4A and 4B present results for grades 4 and 8 for the sample in which accommodations were not permitted.

Grade 4 Scale Score Results by Free/Reduced-Price Lunch Program Eligibility: Sample in Which Accommodations Were Not Permitted

- Students in Massachusetts eligible for the free/reduced-price lunch program had an average science scale score of 139. This was lower than that of students in Massachusetts not eligible for this program (171).
- Students in Massachusetts eligible for the free/reduced-price lunch program had an average scale score (139) that was higher than that of similar students in the nation (129).

Grade 4 Achievement Level Results by Free/Reduced-Price Lunch Program Eligibility: Sample in Which Accommodations Were Not Permitted

- In Massachusetts, 16 percent of students who were eligible for the free/reduced-price lunch program and 53 percent of those who were not eligible for this program performed at or above the *Proficient* level. These percentages were significantly different.
- For students in Massachusetts who were eligible for the free/reduced-price lunch program, the percentage at or above the *Proficient* level (16 percent) was not significantly different from the corresponding percentage for their counterparts around the nation (11 percent).

TABLE 4A

The Nation's Report Card Science 2000 State Assessment

Average science scale scores and achievement level results for public school students by eligibility for the free/reduced-price lunch program at grade 4 for the sample in which accommodations were not permitted: 2000

	Percentage of Students	Average Scale Score	Below *Basic*	At or Above *Basic*	At or Above *Proficient*	*Advanced*
Eligible						
2000 Massachusetts	26 (2.1)	139 (2.6)	47 (3.4)	53 (3.4)	16 (2.3)	1 (0.8)
Nation	37 (1.1)	129 (1.2)	58 (1.3)	42 (1.3)	11 (0.7)	1 (0.2)
Not Eligible						
2000 Massachusetts	70 (2.4)	171 (0.9)	9 (1.0)	91 (1.0)	53 (1.9)	7 (0.9)
Nation	51 (1.9)	159 (1.0)	22 (1.1)	78 (1.1)	37 (1.4)	5 (0.5)
Information Not Available						
2000 Massachusetts	5 (1.9)	155 (8.0)!	25 (9.4)!	75 (9.4)!	37 (10.4)!	3 (****)!
Nation	12 (2.1)	160 (2.4)	22 (2.4)	78 (2.4)	39 (3.4)	6 (1.7)

NOTE: The NAEP science scale ranges from 0 to 300. The achievement levels correspond to the following points on the NAEP science scale at grade 4: *Basic*, 138–169; *Proficient*, 170–204; and *Advanced*, 205 and above. The standard errors of the statistics in the table appear in parentheses.
! Interpret with caution—the nature of the sample does not allow accurate determination of the variability of this statistic.
**** Standard error estimates cannot be accurately determined.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Grade 8 Scale Score Results by Free/Reduced-Price Lunch Program Eligibility: Sample in Which Accommodations Were Not Permitted

- Students in Massachusetts eligible for the free/reduced-price lunch program had an average science scale score of 134. This was lower than that of students in Massachusetts not eligible for this program (168).
- In Massachusetts, students eligible for the free/reduced-price lunch program had an average scale score in 2000 (134) that did not differ significantly from that of eligible students in 1996 (133).
- Students in Massachusetts eligible for the free/reduced-price lunch program had an average science score (134) that did not differ significantly from that of eligible students across the nation (127).

Grade 8 Achievement Level Results by Free/Reduced-Price Lunch Program Eligibility: Sample in Which Accommodations Were Not Permitted

- In Massachusetts, 14 percent of students who were eligible for the free/reduced-price lunch program and 49 percent of those who were not eligible for this program performed at or above the *Proficient* level. These percentages were significantly different.
- In Massachusetts, the percentage of students who were eligible for the free/reduced-price lunch program who performed at or above the *Proficient* level (14 percent) was not significantly different from the corresponding percentage for 1996 (13 percent).
- For students who were eligible for the free/reduced-price lunch program in Massachusetts, the percentage at or above the *Proficient* level (14 percent) was not significantly different from the corresponding percentage of eligible students nationwide (12 percent).

TABLE 4B

The Nation's Report Card Science 2000 State Assessment

Average science scale scores and achievement level results for public school students by eligibility for the free/reduced-price lunch program at grade 8 for the sample in which accommodations were not permitted: 1996 and 2000

	Percentage of Students	Average Scale Score	Below *Basic*	At or Above *Basic*	At or Above *Proficient*	*Advanced*
Eligible						
2000 Massachusetts	20 (1.9)	134 (3.8)	58 (4.6)	42 (4.6)	14 (2.2)	1 (0.4)
Nation	27 (1.1)	127 (1.1)	67 (1.4)	33 (1.4)	12 (1.0)	1 (0.3)
1996 Massachusetts	18 (1.5)	133 (1.8)	62 (2.3)	38 (2.3)	13 (1.6)	1 (0.6)
Nation	29 (1.6)	133 (1.7)*	60 (2.3)	40 (2.3)	14 (1.6)	1 (0.5)
Not Eligible						
2000 Massachusetts	75 (2.6)	168 (1.3)	18 (1.9)	82 (1.9)	49 (2.0)	7 (0.8)
Nation	55 (2.0)	160 (0.9)	29 (1.2)	71 (1.2)	39 (1.2)	5 (0.7)
1996 Massachusetts	73 (3.0)	164 (1.2)	21 (1.5)	79 (1.5)	44 (2.0)	5 (0.7)
Nation	51 (3.6)	155 (1.3)*	32 (1.6)	68 (1.6)	32 (1.9)*	3 (0.7)
Information Not Available						
2000 Massachusetts	6 (1.9)	164 (5.9)!	26 (6.9)!	74 (6.9)!	46 (8.7)!	7 (2.4)!
Nation	18 (2.1)	151 (2.1)	40 (2.5)	60 (2.5)	31 (2.0)	3 (0.7)
1996 Massachusetts	9 (2.8)	149 (6.8)!	43 (9.9)!	57 (9.9)!	29 (6.7)!	3 (1.3)!
Nation	20 (4.4)	154 (3.6)!	33 (3.8)!	67 (3.8)!	34 (3.9)!	4 (1.7)!

NOTE: The NAEP science scale ranges from 0 to 300. The achievement levels correspond to the following points on the NAEP science scale at grade 8: *Basic*, 143–169; *Proficient*, 170–207; and *Advanced*, 208 and above. The standard errors of the statistics in the table appear in parentheses.
If the notation * appears, it signifies that this value is significantly different from the value for 2000.
! Interpret with caution—the nature of the sample does not allow accurate determination of the variability of this statistic.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 and 2000 Science Assessments.

Type of Community in which School is Located

Schools that participated in the assessment were classified into three mutually exclusive types of community in which the school is located: central city, urban fringe/large town, and rural/small town. These categories indicate the geographic locations of schools and are not intended to indicate or imply social or economic meanings for location types. General information (including definitions) about these categories will be available in future technical reports for the 2000 NAEP state assessments. Data are reported for the year 2000 only because between 1996 and 2000, the U.S. Department of Education changed the geographic classifications assigned to a large number of schools. While this has improved the quality of the indicator, it has rendered impossible direct comparisons between 2000 data and earlier years. Table 5A presents fourth- and eighth-grade results according to type of community in Massachusetts and the nation for 2000 in the sample in which accommodations were not permitted.

Grade 4 Scale Score and Achievement Level Results by Type of Community: Sample in Which Accommodations Were Not Permitted

- In 2000 in Massachusetts, the average scale score of students attending schools in central cities was lower than those of students in urban fringes/large towns and rural areas/small towns.
- The average scale scores of students attending schools in all three types of locations were higher in Massachusetts than in similar types of communities nationwide.
- In 2000, the percentage of students attending schools in central cities in Massachusetts who performed at or above the *Proficient* level was smaller than the corresponding percentages for students in urban fringes/large towns and rural areas/small towns.
- The respective percentages of students attending schools in urban fringes/large towns and rural areas/small towns who performed at or above the *Proficient* level were greater in Massachusetts than in similar types of communities nationwide. The percentage of students attending schools in central cities who performed at or above the *Proficient* level did not differ significantly in Massachusetts from that in similar types of communities nationwide.

Grade 8 Scale Score and Achievement Level Results by Type of Community: Sample in Which Accommodations Were Not Permitted

- In 2000 in Massachusetts, the average scale score of students attending schools in central cities was lower than those of students in urban fringes/large towns and rural areas/small towns.
- The average scale scores of students attending schools in urban fringes/large towns and rural areas/small towns were higher in Massachusetts than in similar types of communities nationwide. The average scale score of students in Massachusetts attending schools in central cities did not differ significantly from that in similar types of communities nationwide.
- In 2000, the percentage of students attending schools in central cities in Massachusetts who performed at or above the *Proficient* level was smaller than the corresponding percentages for students in urban fringes/large towns and rural areas/small towns.
- The respective percentages of students attending schools in urban fringes/large towns and rural areas/small towns who performed at or above the *Proficient* level were greater in Massachusetts than in similar types of communities nationwide. The percentage of students attending schools in central cities who performed at or above the *Proficient* level did not differ significantly in Massachusetts from that in similar types of communities nationwide.

TABLE 5A

The Nation's Report Card Science 2000 State Assessment

Average science scale scores and achievement level results for public school students by type of community in which school is located at grades 4 and 8 for the sample in which accommodations were not permitted: 2000

	Percentage of Students	Average Scale Score	Below *Basic*	At or Above *Basic*	At or Above *Proficient*	*Advanced*
Central City						
Grade 4 Massachusetts	26 (1.7)	144 (2.5)	41 (3.6)	59 (3.6)	22 (3.1)	1 (0.7)
Nation	29 (1.5)	137 (2.0)	50 (2.4)	50 (2.4)	19 (1.6)	2 (0.5)
Grade 8 Massachusetts	26 (2.2)	139 (4.0)	54 (4.6)	46 (4.6)	21 (3.7)	2 (0.9)
Nation	28 (1.2)	138 (1.9)	54 (2.2)	46 (2.2)	21 (1.7)	3 (0.6)
Urban Fringe/Large Town						
Grade 4 Massachusetts	62 (2.2)	168 (1.6)	12 (1.9)	88 (1.9)	49 (2.5)	7 (0.9)
Nation	46 (2.4)	154 (1.3)	29 (1.5)	71 (1.5)	33 (1.5)	4 (0.5)
Grade 8 Massachusetts	62 (2.4)	168 (1.4)	18 (2.3)	82 (2.3)	48 (2.3)	7 (0.8)
Nation	45 (2.2)	155 (1.2)	35 (1.4)	65 (1.4)	35 (1.7)	4 (0.7)
Rural/Small Town						
Grade 4 Massachusetts	12 (1.7)	172 (3.3)	9 (2.7)	91 (2.7)	56 (5.8)	10 (3.5)
Nation	25 (2.1)	152 (1.9)	30 (2.1)	70 (2.1)	30 (2.3)	3 (0.7)
Grade 8 Massachusetts	13 (1.6)	171 (2.9)	14 (3.2)	86 (3.2)	56 (5.0)	6 (1.9)
Nation	27 (1.9)	152 (1.8)	38 (2.1)	62 (2.1)	33 (2.0)	4 (0.7)

NOTE: The NAEP science scale ranges from 0 to 300. The achievement levels correspond to the following points on the NAEP science scale at grade 4 (and 8): *Basic*, 138–169 (143–169); *Proficient*, 170–204 (170–207); and *Advanced*, 205 (208) and above. The standard errors of the statistics in the table appear in parentheses.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Toward a More Inclusive NAEP

NAEP endeavors to assess all students selected in the randomized sampling process including students with disabilities (SD) as well as students who are classified by their schools as limited English proficient (LEP). The percentages of students classified as SD or LEP in all participating states and jurisdictions are available in an interactive database at the NAEP web site. It is important to note that school personnel, guided by the student's Individualized Education Program (IEP), make the ultimate decision as to whether or not a particular student should participate in NAEP. Percentages of students excluded from NAEP may vary considerably across states and within a state across years. Comparisons of achievement results across states and within a state across years should be interpreted with caution if the exclusion rates vary widely.

The results displayed in the *The Nation's Report Card: Science Highlights 2000* are based on representative national and state samples that include students with disabilities and limited English proficient students. In past assessments, however, no testing accommodations or adaptations were made available to the special-needs students in these samples. To preserve comparability with the samples from 1996, these assessment results for 2000 are based on a sample of students for whom testing accommodations were not permitted. This sample allowed the maintenance of NAEP trend data.

In the 1996 and 2000 science assessments, however, the NAEP program drew a second, representative national sample of schools. For students in this sample, accommodations were made available. The program has used this split-sample design to study the effects on NAEP results of including special-needs students in the assessments. A series of technical research papers has been published with the results of these comparisons.[1] The *NAEP 2000 Report Card* series is the first to present the results from both the reporting sample of schools in which accommodations were not permitted and the sample in which accommodations were permitted for special-needs students who normally receive them in their state assessments.

Also in 2000, the split-sample design was used for the first time in the state assessment of mathematics and science. Both samples included students who were not classified as having special needs and students who were classified as having special needs. In both samples there were special-needs students who took the NAEP science assessment without accommodations. In the sample where accommodations were permitted, those special-needs students who normally receive accommodations in their state assessment were allowed to receive them for the NAEP assessment, unless the accommodations were judged to change the construct being measured. It should be noted that accommodated students generally make up a small proportion of the total weighted number of students assessed. For example, in the 2000 national science assessment, accommodated students made up 3 percent of the total weighted number of students assessed.

In the NAEP science assessment, more students were excluded from the sample in which accommodations were not offered in 2000 than in prior years. This may be accounted for in a variety of ways. Among the most far-reaching is the implementation of the Individuals with Disabilities Education Act (IDEA). States that have been diligent in implementing IDEA in their state assessment programs may have higher exclusion rates in the NAEP sample that does not permit accommodations. Local district staff who are accustomed to providing accommodations in state testing situations may have opted for exempting students from the NAEP assessment rather than including them without their customary accommodations. In addition, state population shifts may also account for higher exclusion rates.

As a result, exclusion rates vary considerably within states between the current assessment year and past years. In addition, there is considerable variation in exclusion rates across states. Comparisons of achievement results across states and within states across years should be made with caution, since a comparison within a state across years or between two states may be based on samples with exclusion rates that differ considerably.

[1] Olson, J.F. and Goldstein, A.A. (1997). *The inclusion of students with disabilities and limited English proficient students in large-scale assessments: A summary of recent progress*. (NCES Publication No. 97–482). Washington, DC: National Center for Education Statistics.
Mazzeo, J., Carlson, J.E., Voelkl, K.E., & Lutkus, A.D. (1999). *Increasing the participation of special-needs students in NAEP: A report on 1996 research activities*. (NCES Publication No. 2000–473). Washington, DC: National Center for Education Statistics.

Table 6A shows the percentage of students in Massachusetts and the nation who were classified as SD or LEP and also the percentages of students who were excluded in the sample in which accommodations were not permitted. Table 6B shows the same information for the sample in which accommodations were permitted.

TABLE 6A

The Nation's Report Card Science 2000 State Assessment

Percentage of students in Massachusetts and the nation classified as limited English proficient or as having disabilities in the sample in which accommodations were not permitted: 2000

Percentage of students who are	*Grade 4*		*Grade 8*	
	Massachusetts	Nation	Massachusetts	Nation
Classified as LEP	6%	6%	4%	4%
Excluded from the assessment due to LEP	2%	2%	3%	2%
Classified as having a disability	15%	11%	17%	12%
Excluded from the assessment due to disability	9%	6%	11%	6%

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

TABLE 6B

The Nation's Report Card Science 2000 State Assessment

Percentage of students in Massachusetts and the nation classified as limited English proficient or as having disabilities in the sample in which accommodations were permitted: 2000

Percentage of students who are	*Grade 4*		*Grade 8*	
	Massachusetts	Nation	Massachusetts	Nation
Classified as LEP	6%	6%	4%	3%
Excluded from the assessment due to LEP	2%	1%	2%	1%
Tested with accommodations	2%	1%	0%	0%
Classified as having a disability	15%	12%	17%	11%
Excluded from the assessment due to disability	2%	4%	2%	3%
Tested with accommodations	8%	3%	8%	2%

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Table 7 presents a comparison between performance within a state on the two samples: the sample in which accommodations were not permitted, and the sample in which accommodations were permitted. This table displays the number of students assessed in each jurisdiction and indicates whether the scale score difference between the two samples is significant.

TABLE 7

The Nation's Report Card Science 2000 State Assessment

Sample sizes and average scale scores in the sample in which accommodations were not permitted and the sample in which accommodations were permitted for each jurisdiction participating in the 2000 science assessment

	Grade 4				Grade 8			
	Sample in which accommodations were not permitted		Sample in which accommodations were permitted		Sample in which accommodations were not permitted		Sample in which accommodations were permitted	
	N	Average	N	Average	N	Average	N	Average
Alabama	2526	143 (1.7)	2552	143 (1.7)	2400	141 (1.9)	2382	143 (1.7)
Arizona †	2080	141 (1.4)	2068	140 (1.8)	1783	146 (1.6)	1822	145 (1.3)
Arkansas	2175	144 (1.7)	2214	145 (1.3)	2115	143 (1.3)	2140	142 (1.2)
California †	1682	131 (2.0)	1714	129 (3.0)	1650	132 (1.5)	1723	129 (1.8)
Connecticut	2493	156 (1.3)	2550	156 (1.3)	2506	154 (1.4)	2551	153 (1.6)
Georgia	2640	143 (1.4)	2687	142 (1.4)	2550	144 (1.5)	2578	142 (1.6)
Hawaii	2425	136 (1.4)	2439	136 (1.4)	2268	132 (1.2)	2285	130 (1.4)
Idaho †	1717	153 (1.5)	1750	152 (1.4)	1973	159 (1.1)	2003	158 (1.0)
Illinois †	1596	151 (1.6)	1671	150 (2.4)	1753	150 (1.9)	1808	148 (1.7)
Indiana †	1812	155 (1.6)	1870	154 (1.5)	1878	156 (1.7)	1904	154 (1.4)
Iowa †	1887	160 (1.4)	1951	159 (1.3)	----	--- (--.-)	----	--- (--.-)
Kentucky	2248	152 (1.1)	2311	152 (1.2)	2303	152 (1.3)	2383	150 (1.2)
Louisiana	2452	139 (1.9)	2538	139 (1.8)	2373	136 (1.7)	2393	134 (1.5)
Maine †	2094	161 (1.0)	2184	161 (1.1)	2156	160 (1.0)	2254	158 (0.9)
Maryland	2648	146 (1.3)	2737	145 (1.3)	2336	149 (1.3)	2434	146 (1.4)
Massachusetts	2274	162 (1.2)	2351	161 (1.4)	2277	161 (1.6)	2389	158 (1.1)
Michigan †	1875	154 (1.8)	1922	152 (1.8)	2024	156 (1.7)	2047	155 (1.8)
Minnesota †	1853	157 (1.5)	1894	157 (1.6)	1435	160 (2.1)	1458	159 (1.2)
Mississippi	2776	133 (1.4)	2799	133 (1.4)	2495	134 (1.2)	2514	134 (1.2)
Missouri	2367	156 (1.6)	2473	157 (1.2)	2320	156 (1.1)	2415	154 (1.2)
Montana †	1176	160 (2.1)	1201	160 (1.5)	1692	165 (1.2)	1745	164 (1.4)
Nebraska	1289	150 (1.8)	1315	150 (1.8)	1898	157 (1.0)	1863	158 (1.4)
Nevada	2526	142 (1.3)	2619	142 (1.2)	2694	143 (1.1)	2733	141 (1.0)
New Mexico	1895	138 (2.0)	1999	140 (1.8)	1903	140 (1.6)	1981	139 (1.5)
New York †	1764	149 (1.4)	1848	148 (1.3)	1616	149 (2.4)	1697	145 (2.1)
North Carolina	2374	148 (1.4)	2482	147 (1.3)	2342	147 (1.5)	2452	145 (1.4)
North Dakota	2338	160 (0.8)	2400	160 (0.9)	2194	161 (0.9)	2221	159 (1.1)
Ohio †	1887	154 (1.6)	1922	155 (1.4)	2122	161 (1.5)	2169	159 (1.5)
Oklahoma	2377	152 (1.4)	2475	151 (1.3)	2452	149 (1.2)	2515	149 (1.1)
Oregon †	1625	150 (1.9)	1686	148 (2.0)	1751	154 (1.6)	1780	154 (1.4)
Rhode Island	2395	148 (1.5)	2500	148 (1.3)	2360	150 (1.3)	2440	148 (0.9)
South Carolina	2448	141 (1.2)	2495	140 (1.3)	2298	142 (1.3)	2336	140 (1.4)
Tennessee	2496	147 (1.5)	2522	145 (1.4)	2227	146 (1.5)	2257	145 (1.5)
Texas	2125	147 (1.6)	2229	145 (1.8)	2302	144 (1.5)	2331	143 (1.7)
Utah	2652	155 (1.1)	2694	154 (1.3)	2446	155 (0.9)	2475	154 (1.0)
Vermont †	1237	159 (1.7)	1312	160 (1.3)	1966	161 (0.9)	2021	159 (1.0)
Virginia	2502	156 (1.6)	2615	155 (1.4)	2435	152 (1.2)	2508	151 (1.0)
West Virginia	2522	150 (1.1)	2639	149 (1.3)	2436	150 (1.1)	2567	146 (1.1)*
Wyoming	1745	158 (1.1)	1821	156 (1.3)	2560	158 (1.0)	2575	156 (1.0)
American Samoa	453	51 (1.7)	475	54 (1.6)	445	72 (2.3)	471	74 (4.2)
DDESS	1295	157 (0.7)	1300	157 (0.9)	650	159 (1.2)	701	155 (1.6)
DoDDS	2790	156 (0.5)	2825	155 (0.8)	1962	159 (0.8)	1999	159 (0.8)
Guam	996	110 (2.3)	1064	114 (1.2)	945	114 (4.5)	921	114 (1.8)
Virgin Islands	690	116 (1.1)	698	116 (1.7)	----	--- (--.-)	----	--- (--.-)

NOTE: The NAEP science scale ranges from 0 to 300. The standard errors of the statistics in the table appear in parentheses.
† Indicates that the jurisdiction did not meet one or more of the guidelines for school participation in one or both grades.
* Indicates that the average scale score for the sample in which accommodations were permitted was significantly different from the average scale score for the sample in which accommodations were not permitted within a single jurisdiction.
** Indicates that the average scale score for the sample in which accommodations were permitted was significantly different from the average scale score for the sample in which accommodations were not permitted using a multiple comparison procedure based on all jurisdictions that participated.
--- Iowa did not participate at grade 8. Virgin Islands failed to meet participation guidelines to report results at grade 8.
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment.

Where to Find More Information

The NAEP Science Assessment

The latest news about the NAEP 2000 science assessment and the results of the assessment can be found on the science page of the NAEP web site at http://nces.ed.gov/nationsreportcard/science. Information about the assessment and interpretation of results is also available in the Technical Information section on the same web site. The individual *State Reports* are also available on the NAEP web site, http://nces.ed.gov/nationsreportcard. *The Science Framework for the National Assessment of Educational Progress*, on which the assessment is based, is available at http://www.nagb.org.

Participation in 2000

Information on each jurisdiction's participation rates for schools and students can be found in the Technical Information section of the NAEP web site.

Additional Results from the Science Assessment

For more findings from the 2000 science assessments, refer to the NAEP 2000 results at http://nces.ed.gov/nationsreportcard/tables. The interactive database at this site includes student and school variables for all jurisdictions, the nation, and the four NAEP geographic regions. Data tables are also available for each jurisdiction, with all background questions cross-tabulated with the major demographic variables.

Publications on the inclusion of students with disabilities and limited English proficient students

Olson, J.F. and Goldstein, A.A. (1997). *The inclusion of students with disabilities and limited English proficient students in large-scale assessments: A summary of recent progress*. (NCES Publication No. 97–482). Washington, DC: National Center for Education Statistics.

Mazzeo, J., Carlson, J.E., Voelkl, K.E., & Lutkus, A.D. (1999). *Increasing the participation of special-needs students in NAEP: A report on 1996 research activities*. (NCES Publication No. 2000–473). Washington, DC: National Center for Education Statistics.

To Order Publications

Recent NAEP publications related to science are listed on the science page of the NAEP web site and are available electronically. Publications can be also be ordered from:

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TTY/TDD: 1–877–576–7734
FAX: 1–301–470–1244

The *2000 Science State Reports* in this series were prepared by Charlotte Solomon, Laura Jerry, and Anthony Lutkus of Educational Testing Service.

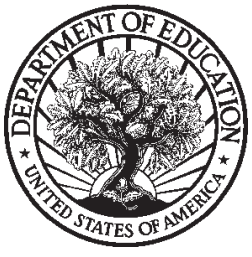
What is The Nation's Report Card?

THE NATION'S REPORT CARD, the National Assessment of Educational Progress (NAEP), is the only nationally representative and continuing assessment of what America's students know and can do in various subject areas. Since 1969, assessments have been conducted periodically in reading, mathematics, science, writing, history, geography, and other fields. By making objective information on student performance available to policymakers at the national, state, and local levels, NAEP is an integral part of our nation's evaluation of the condition and progress of education. Only information related to academic achievement is collected under this program. NAEP guarantees the privacy of individual students and their families.

NAEP is a congressionally mandated project of the National Center for Education Statistics, the U.S. Department of Education. The Commissioner of Education Statistics is responsible, by law, for carrying out the NAEP project through competitive awards to qualified organizations. NAEP reports directly to the Commissioner, who is also responsible for providing continuing reviews, including validation studies and solicitation of public comment, on NAEP's conduct and usefulness.

In 1988, Congress established the National Assessment Governing Board (NAGB) to formulate policy guidelines for NAEP. The Board is responsible for selecting the subject areas to be assessed from among those included in the National Education Goals; for setting appropriate student performance levels; for developing assessment objectives and test specifications through a national consensus approach; for designing the assessment methodology; for developing guidelines for reporting and disseminating NAEP results; for developing standards and procedures for interstate, regional, and national comparisons; for determining the appropriateness of test items and ensuring they are free from bias; and for taking actions to improve the form and use of the National Assessment.

The National Assessment Governing Board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